

Microbiology

Code: 102660
ECTS Credits: 3

Degree	Type	Year	Semester
2502445 Veterinary Medicine	OB	2	1

Contact

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Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: No
Some groups entirely in Spanish: No

Other comments on languages

A part of practical classes will be taught in English

Teachers

Francesc Accensi Alemany

Prerequisites

Although there are no official prerequisites, it is desirable that the student be very aware of the knowledge acquired in the subject of Microbiology

Objectives and Contextualisation

This is a compulsory second course subject in which the student will have to acquire the theoretical and practical knowledge that will allow him to obtain knowledge of Virology (what are the basic techniques and methods for studying viruses, as well as the virus-host relationships; basic diagnostic techniques; prevention and control; viral taxonomy fundamentals; leading viruses of interest in Veterinary Medicine, focusing on emerging pathogens and zoonotic agents) and on the applications of Immunology in Veterinary Medicine (immunodiagnostic techniques, know how they work, understand their mechanism and their interpretation ...), especially in vaccines as a measure of prevention and control of diseases.

The specific training objectives of this subject are:

- Introduce the student to the basics of Virology.
- Provide knowledge about techniques and methods of work in Virology.
- To know the main virus of veterinary significance, as well as the existing control systems of the same.
- Know the applications of viruses at the biotechnological level, ecological level among others
- Know the prions and the problems that arise from them.
- Introduce to the student the applied aspects of the immune response, such as vaccines and immunodiagnostic tests.
- Provide some knowledge about the techniques and immunological methods

Competences

- Comunicar la informació obtinguda durant l'exercici professional de manera fluïda, oralment i per escrit, amb altres col·legues, autoritats i la societat en general.
- Demonstrate knowledge of English to communicate both orally and in writing in academic and professional contexts.
- Demonstrate knowledge of the rights and duties of the veterinarian, with a special focus on ethical principles
- Demonstrate knowledge, understanding and differentiation of the main biological agents of veterinary interest.
- Perform basic analytical techniques and interpret the clinical, biological and chemical results, and interpret the results of tests generated by other laboratories.
- Seek and manage information related with professional activity

Learning Outcomes

1. Apply suitable methodologies for the study of viruses.
2. Communicate information obtained during professional exercise in a fluid manner, orally and in writing, with other colleagues, authorities and society in general.
3. Demonstrate knowledge of English to communicate both orally and in writing in academic and professional contexts.
4. Describe and appreciate the applications of viruses.
5. Describe the basic diagnosis techniques of virology.
6. Describe the main types of vaccines.
7. Explain the nature, structure and genetics of viruses.
8. Identify basic taxonomy of viruses.
9. Identify the technical applications of immune response.
10. Interpret the results of the basic microbiological techniques in virology.
11. Recognise and characterise viruses as causal agents of disease in animals in order to diagnose and control them.
12. Recognise the bases of immunodiagnosis techniques.
13. Recognise the microorganism-host relationship, virulence and the pathogenicity mechanisms of viruses.
14. Seek and manage information related with professional activity

Content

The contents of the subject are divided into seven blocks:

Block I. Introduction to Virology: General characteristics of viruses. Viral genetics Types of viruses.

Block II. Virus-host relation: Resistance of the host. Environmental factors Pathogenicity and virulence. Stages of infection.

Block III. Viral taxonomy: Main viruses of veterinary interest. Single-stranded DNA viruses, double-stranded DNA viruses, single-stranded RNA viruses, double-stranded RNA viruses, retroviruses.

Block IV. Applications of viruses: Viruses and gene transfer.

Block V. Prions: subvîricos agents and prions. Differential characteristics. Importance to veterinarian and public health.

Block VI. Immunodiagnostic techniques: Valuation of the humoral base and cellular immune based immune response.

Block VII. Vaccines: Vaccines and serotherapy. Concepts Types of vaccines. New vaccine strategies.

The content of the laboratory practices of the subject is as follows:

- Techniques of study of viruses. Study of the action of bacteriophages. Effect of viruses on cell cultures.
- Immunodiagnostic techniques. Techniques to measure humoral and cellular immune response. Use of clinical samples
- Preparation of autovaccins

Methodology

The teaching methodology used during the learning process of the present subject is mainly based on the work of the student. The teacher's task will be to guide him in this task, either by providing the information or by advising him on where he can obtain it, as well as guiding and supervising the student's work. Thus, the following training activities will be carried out:

- Master classes: through this type of classes, the student acquires the basic scientific knowledge of the subject that will have to complement later with the personal and autonomous study. The student will be able to download from the Virtual Campus platform in pdf format the presentations MS Power Point or Prezi that the teacher will use in each master class, to be able to use it as a guide / support to take notes.
- Practical sessions in the laboratory: through this type of classes, carried out in small groups, it is tried to contrast, while completing and reinforcing them, the knowledge acquired in the theoretical classes. The student will be able to download the practical script of the Virtual Campus platform (in pdf format). In the case of the practices corresponding to blocks VI and VII, this script will be written in English. The practices of blocks VI and VII will be made in English. At the end of the course, there will be a self-evaluation activity in the computer room, which will consist of a small test test (in English) that will be used by the student to evaluate their use of the sessions .
- Tutorials programmed: tutorials are sessions arranged to inform about the content and development of teaching activities of the subject: as well as to resolve doubts, clarify concepts, correct errors and discuss specific aspects of the subject.
- Group work / seminars: The group work activity aims to improve the ability to write, communicate and synthesise a scientific topic and at the same time encourage teamwork. Thus, the knowledge obtained in the theoretical and practical sessions of the subject will be worked out, with the aim of deepening certain aspects, promoting a critical discussion. In addition, this activity will allow to promote the capacity for analysis and synthesis: from the reading of a scientific article provided by the teacher, students in groups of 4 will have to make a presentation in MS Power Point or Prezi (with the text of the slides in English), which will be presented briefly in front of the teachers and other students at a pre-agreed date (Seminar 3). A seminar will be held (Seminar 2) in order to clarify the doubts, especially of methodological type, that may arise in the realization of this work. A seminar will be held to discuss in a small group the subject of prions and subviral particles (Seminar 1).

Other teaching materials that are provided to the student during the course will be available to the student through the Virtual Campus platform. In addition, the aforementioned platform will be used as a mechanism for the exchange of views and information between students and teachers of the subject.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Magister class	8.5	0.34	2
Seminars	3	0.12	14, 2, 3
laboratory practices	15	0.6	
Type: Supervised			
Tutorial class	2	0.08	
Type: Autonomous			
Autonomous study	32	1.28	14, 3
selflearning	11	0.44	14, 2, 3

Assessment

The evaluation will be individual and will be carried out continuously during the development of the different programmed activities of the subject. The minimum global score to successfully pass the subject is 5 points out of 10.

The overall weight of each one of them will be the following:

Exam (80% weight in the overall note)

It is a written test about the knowledge acquired during the subject, which the student will have to do at the date set in the general programming. The exam will be written in Catalan (if you want a version in Spanish, you must request it with a minimum of 15 days in advance). It consists of two parts. It will be necessary to obtain a minimum of 5 points on 10 of each of the parts of the exam to be able to overcome it. The first part (blocks I-V) is type test and the second part (blocks VI-VII) is written, that is, short questions or development. This second part, if the student so requests, may be oral. Maximum score of the exam in the overall grade (out of 10): 8 points. If you do not pass the exam or you have not presented, you will be able to do a recovery on the dates indicated in the general program of the course.

Group Work Activity (20% weight in the overall note)

In groups of 4 students, students must make a brief oral presentation about a scientific article proposed by the teaching staff. Maximum score in the overall score (out of 10): 2 points. The realization of the work is obligatory. Without doing the group work activity, the student can not pass the evaluation of the subject, suspending it.

Attendance to the practice sessions in the laboratory is mandatory, and can justify the absence of a session. Without the realization of the practices, the student will not be able to appear to the examination, suspending the subject.

It is considered "presented" when the student attends the examination of the subject.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Examen	80%	2.5	0.1	1, 2, 6, 4, 5, 7, 8, 9, 10, 11, 13, 12
Oral presentation (group)	20%	1	0.04	1, 14, 2, 3, 6, 4, 5, 7, 8, 9, 10, 11, 13, 12

Bibliography

Text Books

- Mahy, BWJ & van Regenmortel MHV (eds). 2008. Encyclopedia of Virology. 3ª edició. Academic Press.
- Richman, D. et al 2002. Clinical Virology. 2ª edició. ASM Press.
- Vadillo, S. et al 2002. Manual de Microbiología Veterinaria. McCraw-Hill-Interamericana.
- Abbas, AK. et al. 2017. Cellular and Molecular Immunology. 9ª edició. Saunders Elsevier.
- Gómez-Lucía, E. et al. 2007. Manual de Inmunología Veterinaria. Pearson.
- Murphy, K. & Weaver, C. 2017. Janeway's Immunobiology. 9ª edició. Garland Science.
- Tizard, I. 2013. Veterinary Immunology: An Introduction. 9ª edició. Elsevier.